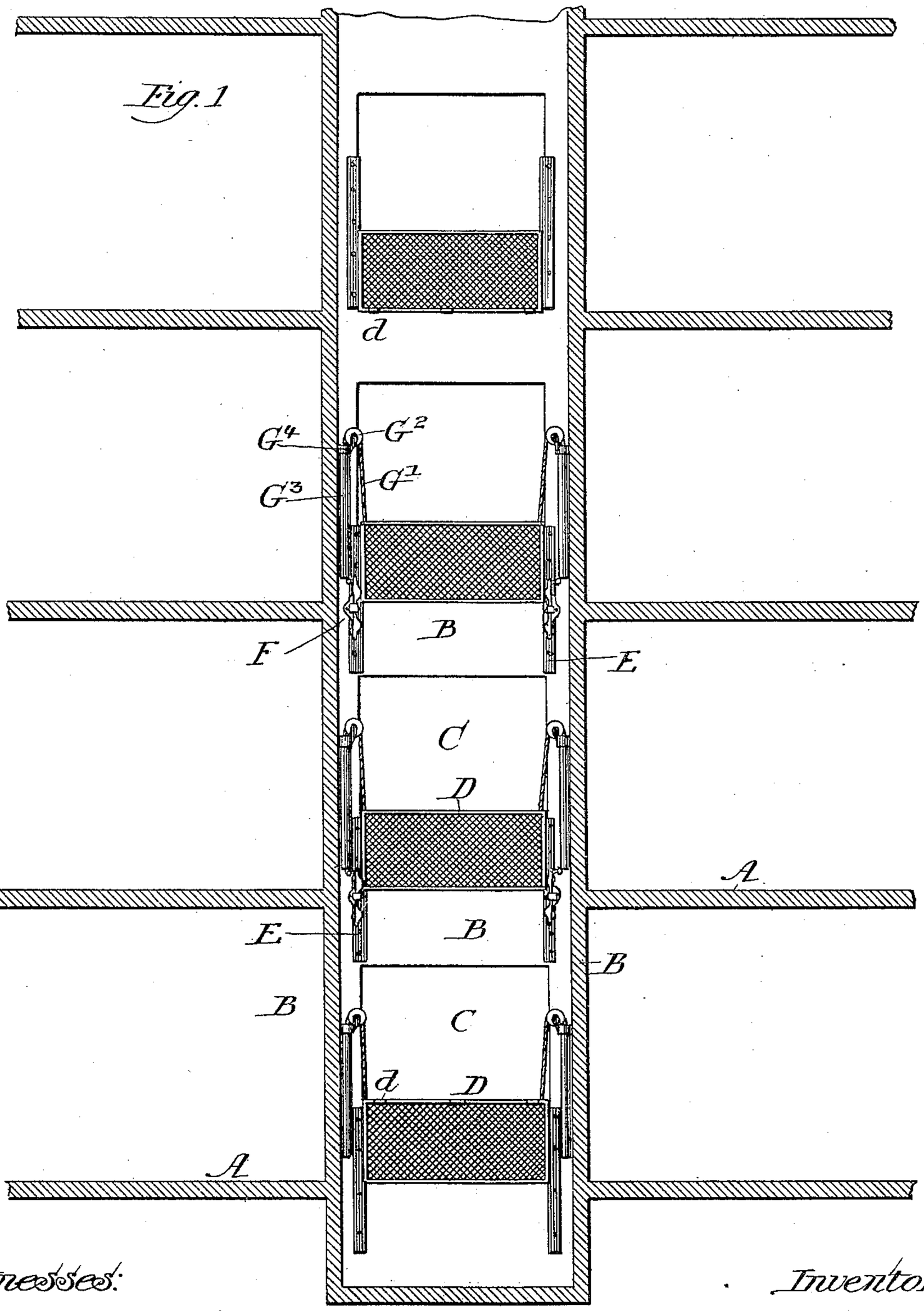
(No Model.) 3 Sheets—Sheet 1.

A. NEWELL.

MEANS FOR OPERATING ELEVATOR GATES.

No. 428,126. Patented May 20, 1890.

Fig. 1



Witnesses:

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Robert Ryan

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(No Model.) 3 Sheets—Sheet 2.

A. NEWELL.

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Fig. 2.

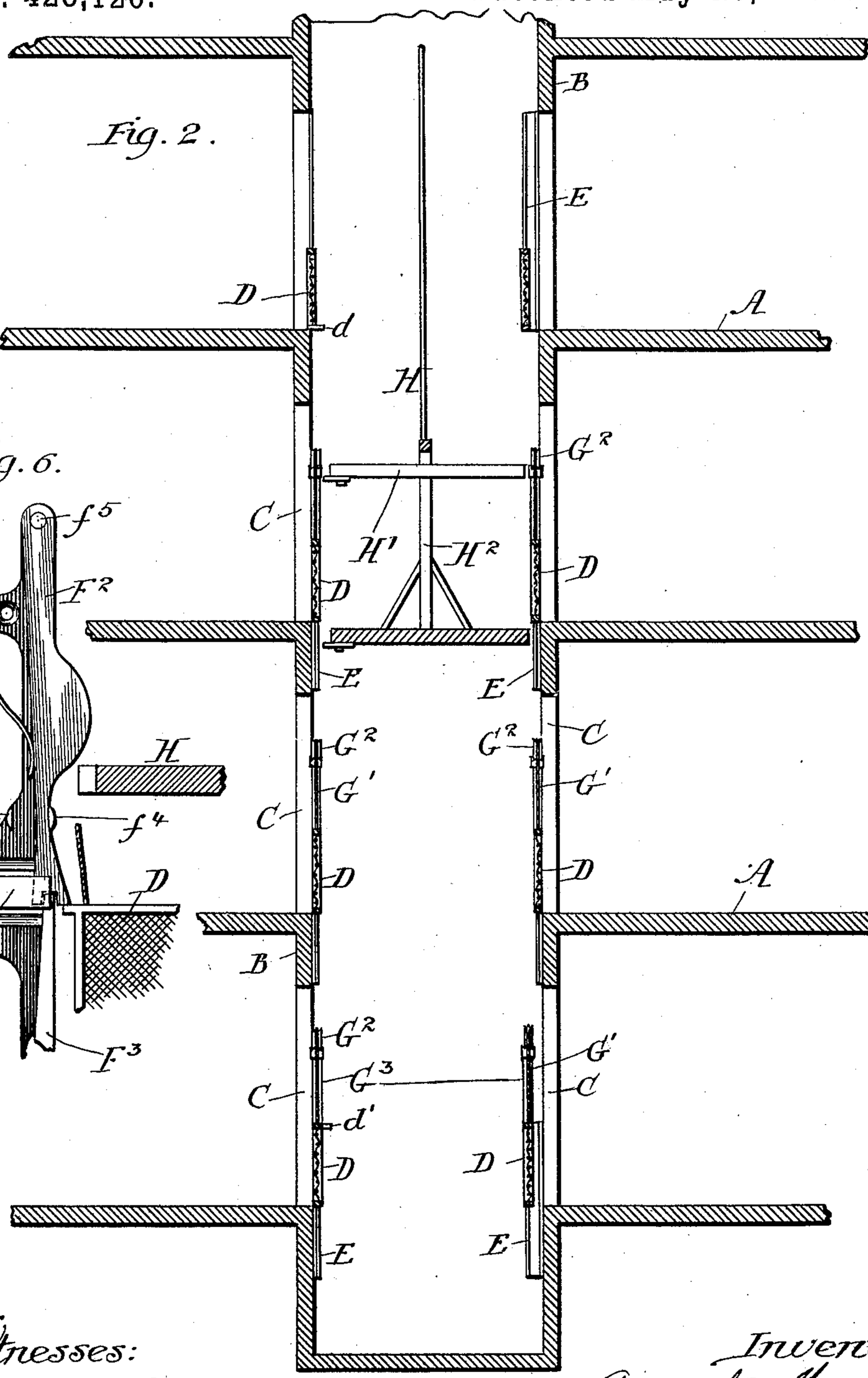

Fig. 6.

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(No Model.)

3 Sheets—Sheet 3.

A. NEWELL.

MEANS FOR OPERATING ELEVATOR GATES.

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Fig. 3.

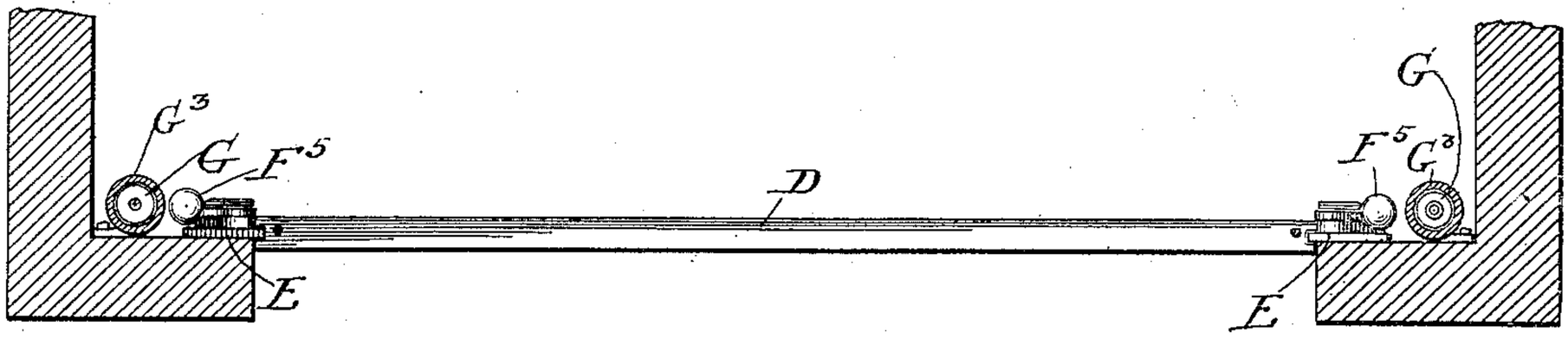

Fig. 4.

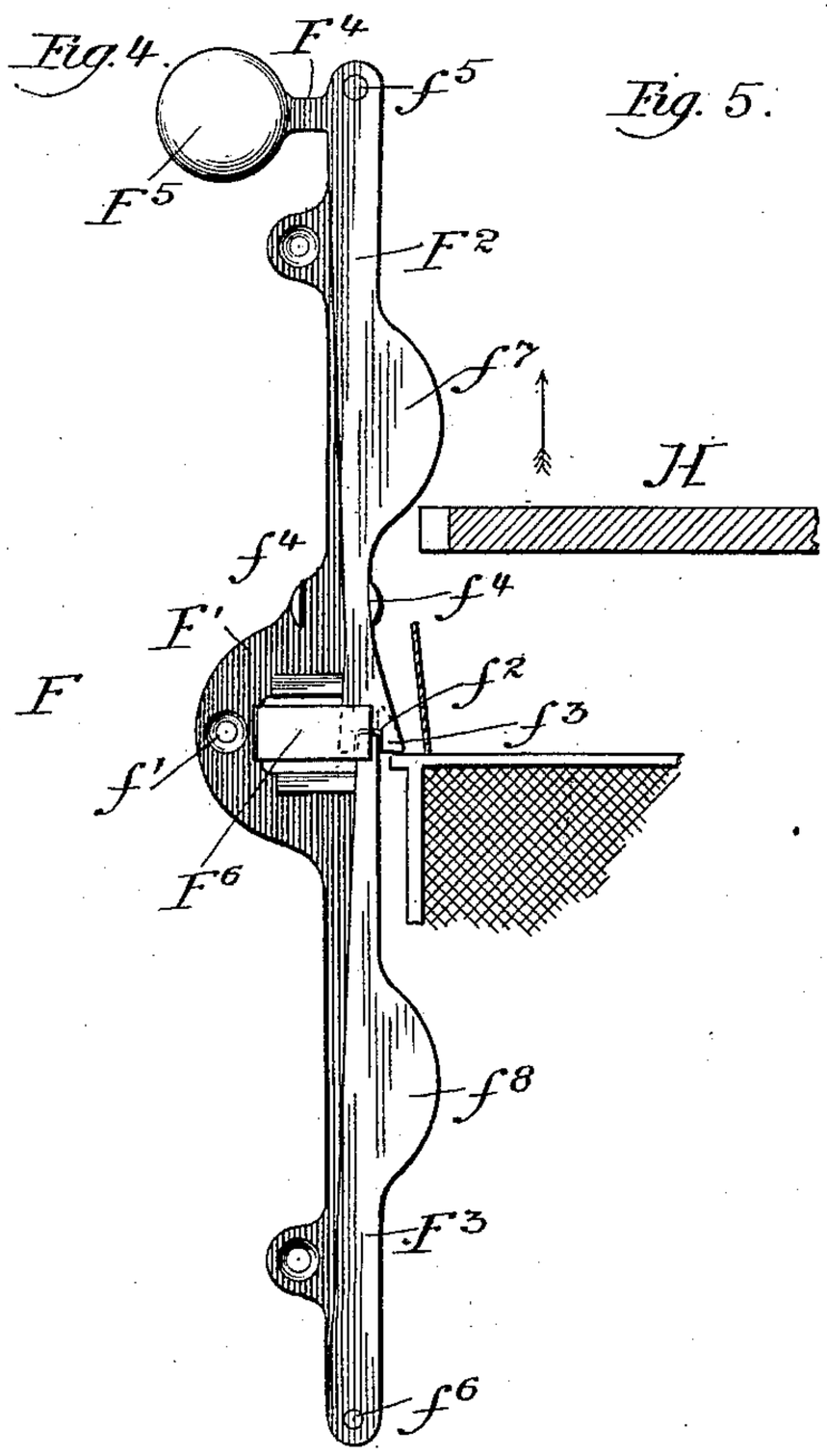

Fig. 5.

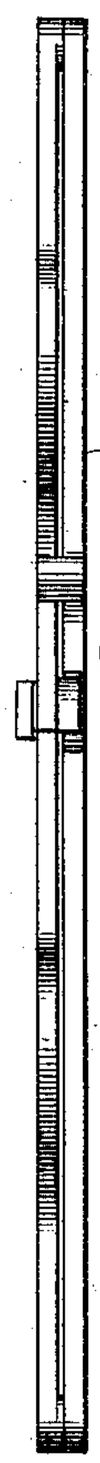

Fig. 7.

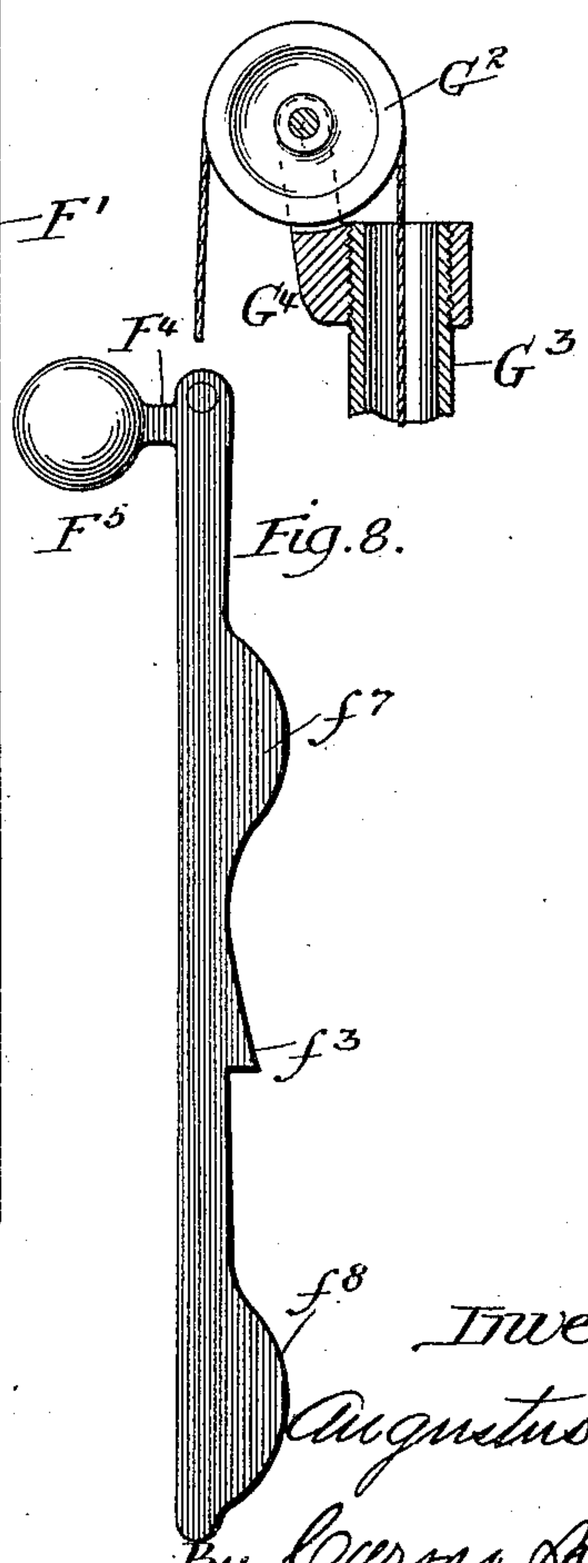

Fig. 8.

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Inventor:
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UNITED STATES PATENT OFFICE.

AUGUSTUS NEWELL, OF CHICAGO, ILLINOIS.

MEANS FOR OPERATING ELEVATOR-GATES.

SPECIFICATION forming part of Letters Patent No. 428,126, dated May 20, 1890.

Application filed July 27, 1889. Serial No. 318,808. (No model.)

To all whom it may concern:

Be it known that I, AUGUSTUS NEWELL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Means for Operating Elevator-Gates; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to elevator-shafts in which safety-gates are provided for forming barriers at the entrances to the shaft at different floors, and the improvements are particularly applicable to shafts for what are termed "freight-elevators," such as are used in stores, warehouses, and manufactories for carrying stock and commodities up or down from one portion of the building to another. The frequent accidents to persons by falling down such shafts unguarded at their entrances have demonstrated the necessity of such a barrier. Various forms of such barriers have been used. Most of them have been constructed to require opening and closing manually by the operator of the elevator, while a few have been partially automatic and a few have been made wholly automatic. So far as I have been informed, those which have been made wholly automatic are unsatisfactory, because they require so much additional work of the elevator, complex connection being made with the latter, and the barriers being dependent upon the power of the elevator for their movement. Those which have been made non-automatic or only partially automatic have been both cumbersome and unreliable. It is to be noted here that such an elevator-shaft should have barriers whose operation is always certain.

The elevator-shaft which I describe herein is provided with entrance-guards which will always positively and automatically assume their position before the entrance to the elevator when the latter leaves the floor at which it stands, whether it moves up or down. These barriers are in the form of vertically-moving horizontal gates, which always stand and remain before the entrances to the shaft without reference to the movements or position of the elevator unless drawn out of the way manually by the attendant. On being so drawn down the gate is engaged and held by mechanism which is disengaged by the movement of the elevator in either direction, whereupon the gate is raised by a counter-balance to stand before the entrance. It will be seen that while the elevator is in motion the gates stand before the entrances and have no connection with the elevator, and that when the elevator reaches a floor it does not move the gates. At such time the attendant on the elevator stops the latter on a level with the floor, and then presses the gate downward until its top is even with or a little lower than the floor, in which position it is engaged mechanically, as before stated. Then when the elevator starts either up or down it does not move the gate from its depressed position, but merely disengages the gate, so that the counter-balance may perform its work of lifting the gate. These remarks apply to the floors intermediate between the uppermost and the lowest, and they are also applicable to the uppermost and the lowest floors if it is desired to there use the same form of apparatus; but the apparatus may be simplified by arranging for the lifting of the uppermost gates by the elevator when it ascends and allowing them to descend by their weight into their position before the entrances when the elevator descends, and by arranging to cause the elevator, when it descends, to engage the lowest gates and press them down even with or below the floor and allowing them to rise by the action of the counter-balance when the elevator again rises.

The details of the elevator-shaft, the elevator, the gates, the engaging and releasing mechanism, and the counter-balances are described below and illustrated in the drawings.

In said drawings, Figure 1 is a vertical section parallel to the gates and through the elevator-shaft, showing a series of floors. Fig. 2 is a similar vertical section taken at right angles to the gates. Fig. 3 is a horizontal section taken above one of the gates. Figs. 4, 5, and 6 are details of the engaging and releasing mechanism. Fig. 7 is a detail of the counter-balance mounting. Fig. 8 is a detail view of an arm.

A A are the floors of the building.
B B are the walls of the elevator-shaft.
C C are the entrances to the elevator-shaft.
D D are the gates.
E E are the ways on which the gates run.

Each assemblage of parts constituting the engaging mechanism for one end of the gate I term a "lock," and the same is designated by the letter F.

G G designate the weights which constitute the counter-balances.

I will first describe in detail the shaft and its appurtenances at one of the floors intermediate between the uppermost and the lowest floors. This description will answer for all of the floors between the uppermost and the lowest.

The gates D are by preference made only about half the height of a man, so that they will form a barrier from the floor upward to a sufficient height to prevent persons from walking into the elevator-shaft. The ways E are applied vertically at the sides of the entrance C a little within the elevator-shaft and rise about the height of the gate above and below the floor, so that the gate is controlled by these ways when above the floor or below it. The ends of the gate may be of any suitable form to adapt them to engage with the ways E. A cord, rope, or chain G′ is attached to each corner of the gate and extends upward over the roller G^2 and thence down to the counter-balance G, to which it is attached. The counter-balance G, the roller G^2, and the rope G′ should be so disposed with the corners of the elevator-shaft as to allow the elevator to pass without hinderance. The counter-balance G is shown as inclosed within a vertical tube G^3 and the roller G^2 as being mounted upon the upper end of such tube by means of the bracket G^4. The bracket G^4 has a cylindric sleeve of proper diameter to loosely surround the upper end of said tube, so that said bracket may be turned laterally to the proper angle to bring said roller into the proper position with reference to the said tube and the end of the gate; or said sleeve may be small enough to fit closely within the upper end of the tube, the bracket being first set at the proper angle. In either case said bracket may be threaded upon the end of the tube, as shown in Fig. 7. The two counter-balances G are heavier than the gate, so that unless the latter is restrained it is carried to and held in the elevated position by the combined influence of the two counter-balances. This mounting makes complete provision for the raising and lowering of the gate, and I need only to explain the locks by which the gate is held in its depressed position.

Each gate may be operated by only one lock applied at one end of the gate; but I show a pair of locks to each gate—one applied to each end. When two locks are used, the gate is held more evenly.

F′ is a plate applied vertically to the wall of the elevator, close to the end of the gate. Such plate may be secured by bolts or nails *f*, extending through the holes *f′*. At the upper end of said plate F′ an arm F^2 is pivoted upon a post f^5 and extended downward, so as to move after the manner of a pendulum, and extends downward from the line in which the upper side of the gate is to start when the latter is depressed. From the lower end of the plate F′ a similar arm F^3 is hinged upon a post f^6 and extends upward and is connected by a suitable joint with the end of the upper arm F^2. The drawings show this joint formed by providing the lower end of the arm F^2 with a notch f^2 and extending the upper end of the arm F^3 into such notch. Under this arrangement the two arms must move in unison. If either is moved laterally, the other must move in the same way. A projection f^3 may be supported by either of these arms near the said joint and extend laterally when the arms have been moved toward the gate into the path of the corner of the gate, so as to engage the latter, when depressed, over such projection and prevent the gate from rising. Suitable stops f^4, placed at the sides of either of the arms, limit the lateral movement of the arms and through the latter of the projection f^3. From the side of the arm F^2 opposite the gate a short arm F^4, bearing a weight F^5, extends horizontally in such manner as to tend to hold the lower end of the arm F^2 at its farthest limit toward the gate, so that the projection f^3 is always in the path of the corner of the gate unless pressed aside by the elevator, as will now be described. On the side of the arm F^2 toward the gate and elevator and between the ends of said arm an extension f^7 is extended laterally sufficiently to stand in the path of some part of the elevator II when said arm is at its farthest limit toward the gate. A similar extension f^8 is placed upon the arm F^3. It is apparent from an inspection of Fig. 4 that the elevator in passing either up or down will bear against these extensions f^7 and f^8 and move said arms and the projection f^3 laterally away from the end of the gate, so as to move said projection f^3 from its engaging position whether the gate is in its elevated or depressed position. If the gate is depressed and engaged, as shown in Fig. 4, the elevator on ascending, as indicated by the arrow, will form contact with the extension f^7 and push the said arms and projection f^3 laterally and allow the gate to rise.

F^6 is a guard rising from the plate F′ and extending over the ends of the arms F^2 and F^3, so as to guide the latter in their movements. In lieu of the weight F^5, a spring F^7 may be applied in any suitable way to hold the arms F^2 and F^3 toward the gate. Fig. 6 shows one mode of applying such a spring.

The gate for the lowest floor is mounted in the same manner as are the intermediate gates; but no locks need be used if it is desired to dispense with them. Projections *d′* may extend into the path of the elevator

from the upper portion of the gate, so as to be engaged by the elevator in its descent, whereby the gate is depressed by the descending elevator and there held until the elevator again rises. The uppermost gate is shown as mountedwithout a counter-balance as well as without the locks, and the lower portion of the gate has projections *d* extending inward into the path of the upper portion of the elevator-frame, so that when the latter rises it engages said projections and carries the gate upward with it and retains it there until the elevator again descends, whereupon the gate descends by its own weight to its position to the entrance of the elevator-shaft.

It is to be noted that the projections *d d'* on the uppermost and lowest gates are not essential to the operation as described. In lieu of the said projections, each of said gates may be set farther in from the wall of the elevator-shaft than the intermediate gates, so that the elevator in rising or descending will engage said gates directly. This is illustrated in the gates on the right wall of Fig. 2.

When no part of the frame of the elevator is at the proper height to lift the uppermost gates, then a horizontal arm H′ is to be applied to the upper portion of the usual upright H^2 of the elevator, the ends of said arm extending out just far enough to engage said gates.

It is to be observed, further, that the lock may be formed by the use of only one of the arms F^2 or F^3. Either of these arms may be omitted and the other extended at its free end past the projection f^3 (which it must support or control) to a sufficient distance to support a second extension like F^7 or F^8. Then, whether the elevator moves up or down, the two extensions will be engaged by the elevator, and the single extended arm F^2 or F^3 will be moved laterally, so as to carry the projection f^3 out of the path of the gate. This form of the lock is illustrated in Fig. 8.

I claim as my invention—

1. An elevator-shaft and elevator comprising one or more entrances from several floors, as herein described, a gate or gates arranged at the intermediate entrance or entrances, said gate or gates being arranged on suitable ways and provided with a suitable counter-balance heavier than the gate, and a lock having a projection held normally in the path of the gate and controlled by a moving part or parts, which extend into the path of the elevator above and below such projection, whereby said projection is moved out of the path of the gate by the elevator when the latter moves up or down past such lock, and a gate at the lowest entrance arranged on similar ways and provided with a counter-balance and arranged to be engaged by the elevator upon the descent of the latter, and a gate at the uppermost entrance arranged to be engaged by the elevator when the latter ascends, substantially as shown and described.

2. The combination, with an elevator-shaft and elevator having one or more entrances, as herein described, of a gate or gates arranged at such entrance or entrances, said gate or gates being arranged on suitable ways and provided with a suitable counter-balance heavier than the gate, and an arm or arms controlling a projection arranged to extend into the path of said gate, a weight or spring arranged to hold said arms laterally toward the gate, and lateral extensions on said arm above and below said projection standing in the path of the elevator, substantially as shown and described.

3. The combination, with an elevator-shaft and elevator having one or more entrances, as herein described, of a gate or gates arranged at such entrance or entrances, said gate or gates being arranged on suitable ways and provided with a suitable counter-balance heavier than the gate, and a plate F′, placed opposite the end of the gate, arms F^2 and F^3, applied to said plate, connected by a joint at their meeting ends, and bearing a projection extending in the path of the gate, and hinged to said plate at their opposite ends, and having the meeting ends held normally toward the gate by a weight or spring, and each having an extension reaching into the path of the elevator, substantially as shown and described.

4. The combination, with an elevator-shaft and its elevator and a gate at the entrance to such elevator, said gate being arranged on suitable ways, of a tube G^3 and bracket G^4, mounted loosely upon the upper end of said tube, a roller G^2, supported upon said bracket, and a rope or chain G′, extending from said counter-balance over said roller to the gate, substantially as shown and described.

In testimony whereof I affix my signature, in presence of two witnesses, this 20th day of July, in the year 1889.

AUGUSTUS NEWELL.

Witnesses:

AMBROSE RISDON,

CYRUS KEHR.